

# SWH-ME910C1-NA LTE Cat-M / NBiot North America

## Product description

The SWH is a board level Cellular Terminal  
For LTE CAT-M / NBiot with GNSS support

Rev.15 – 19/SEP/2019



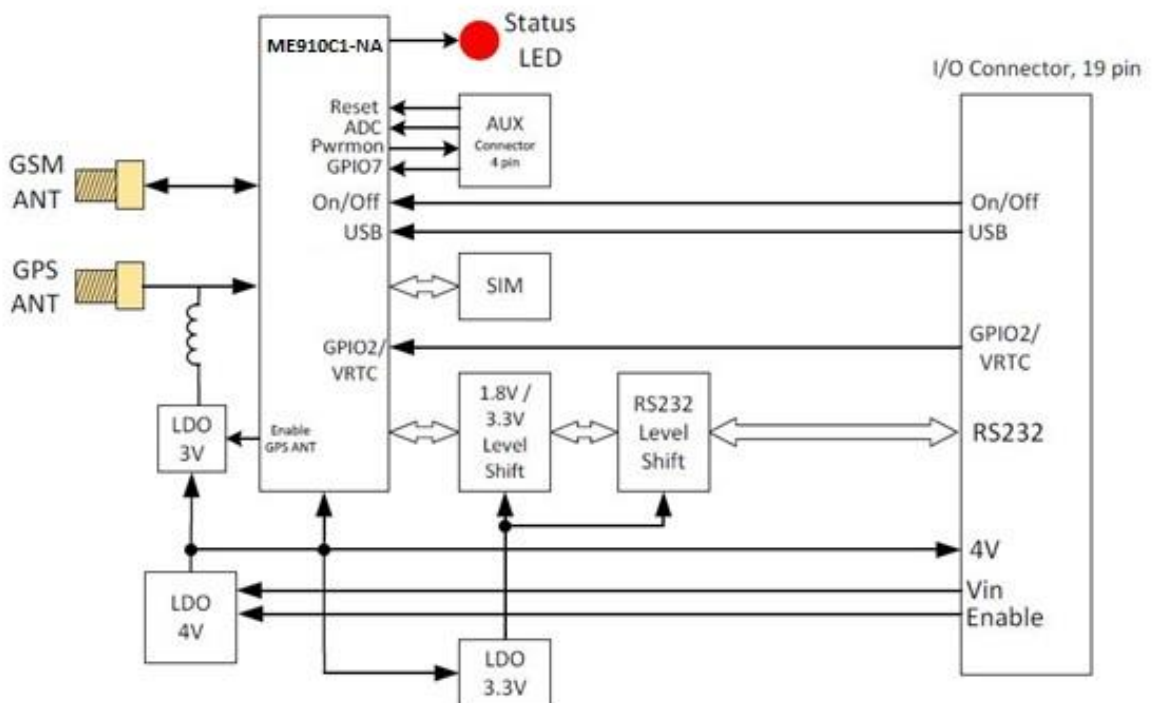
## 1. Overview

The SWH is a complete board level Cellular Terminal solution for LTE Cat-M / NBiot with GNSS support. Based on Telit ME910C1-NA module.

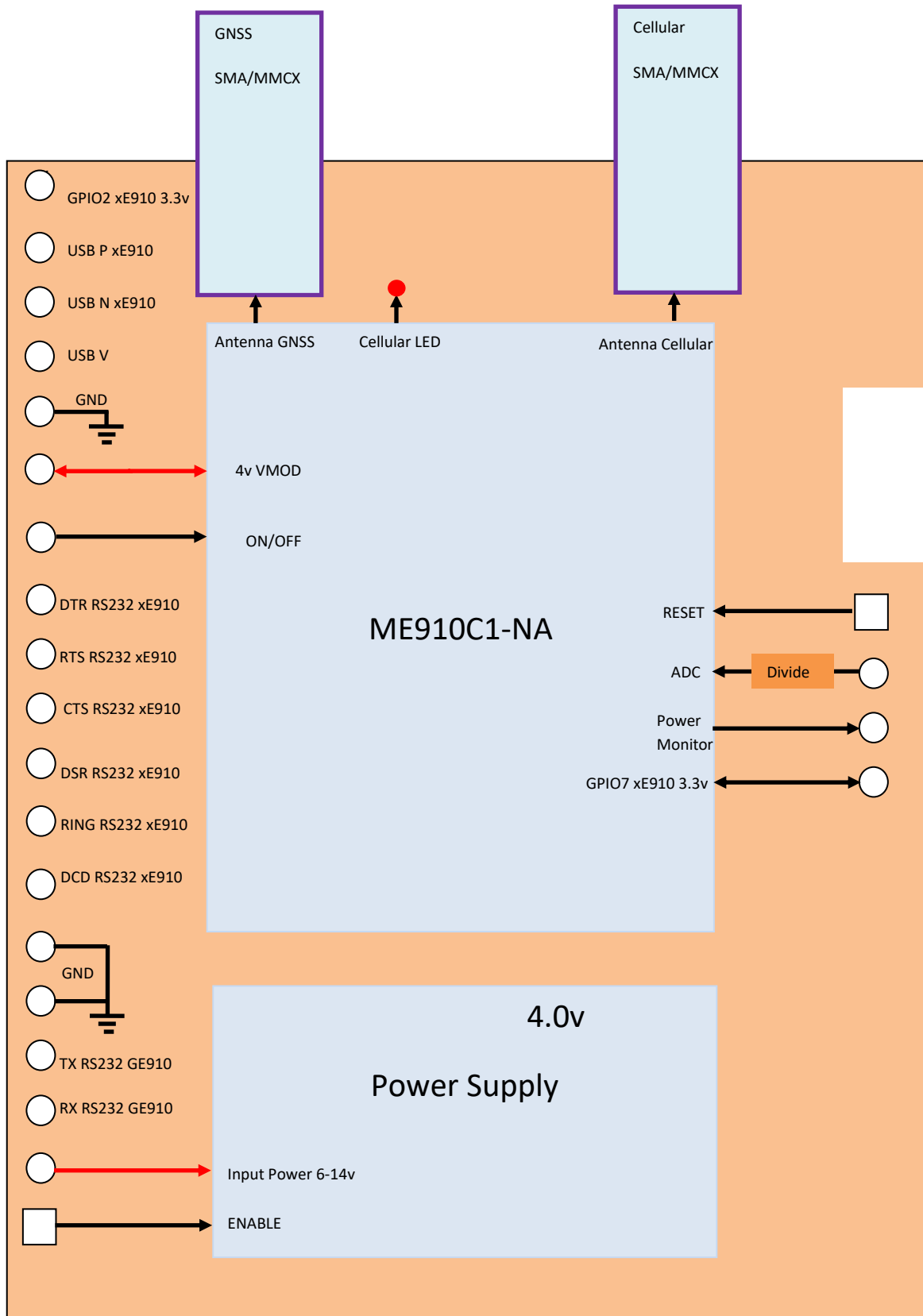
## 2. Hardware Interface Description

### 2.1 Main features of the SWH

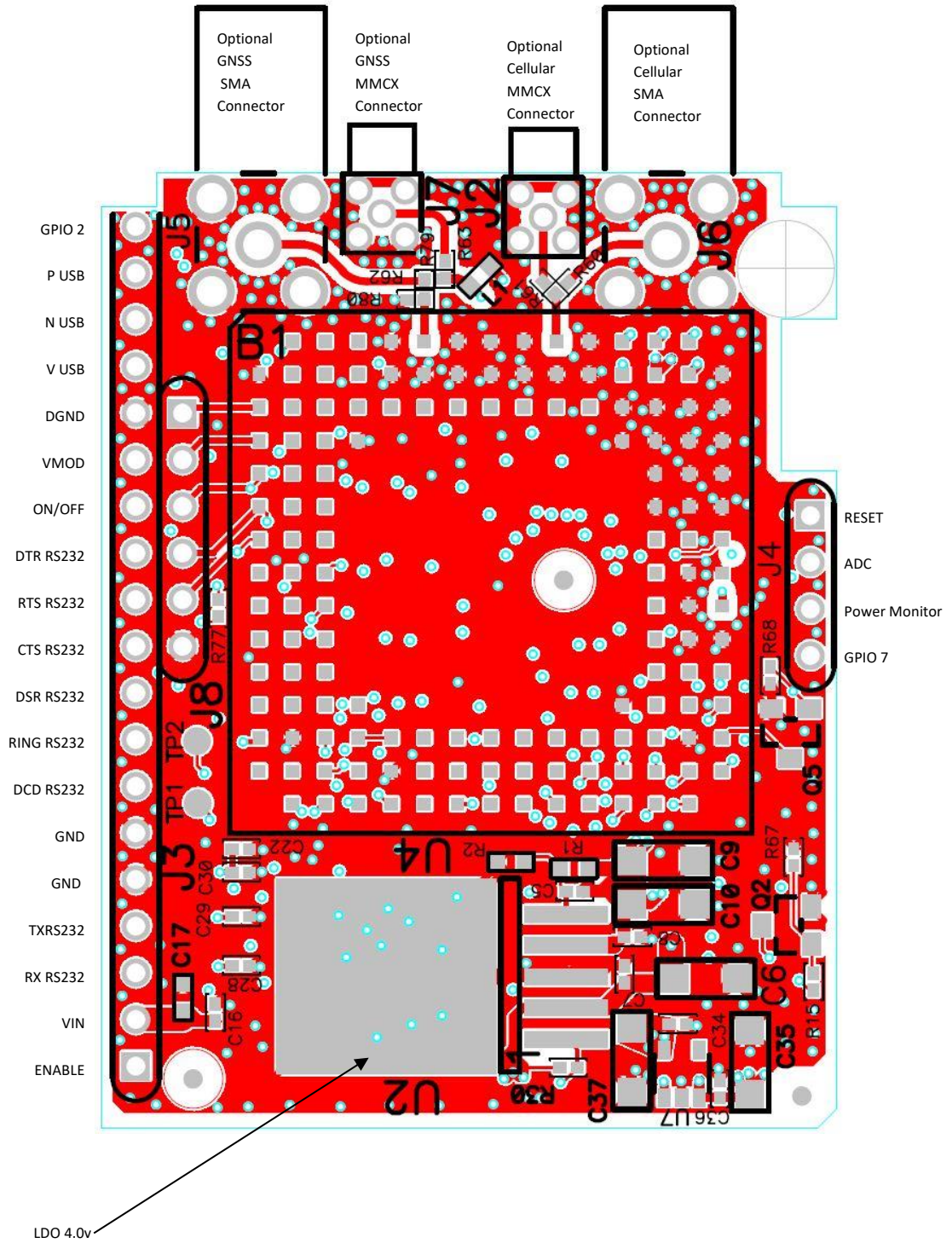
Feature	Implementation
Incorporates LTE Cat-M / NBiot Telit ME910C1-NA module	The Telit module handles all Cellular and GNSS
Frequency bands	<b>ME910C1-NA</b> <b>4G bands:</b> B2(1900),B4(AWS1700),B12(700)B13(700)
Power supply	Single supply voltage 5V DC to 14V DC Option: LiPo battery 3.7V / Li/SOCI2 battery 3.6V
Communication	Modem Full RS232 through 8 pins (see section 2.2) Option UART TTL level Modem USB
Antennas	LTE, GNSS Optional connectors: SMA or MMCX



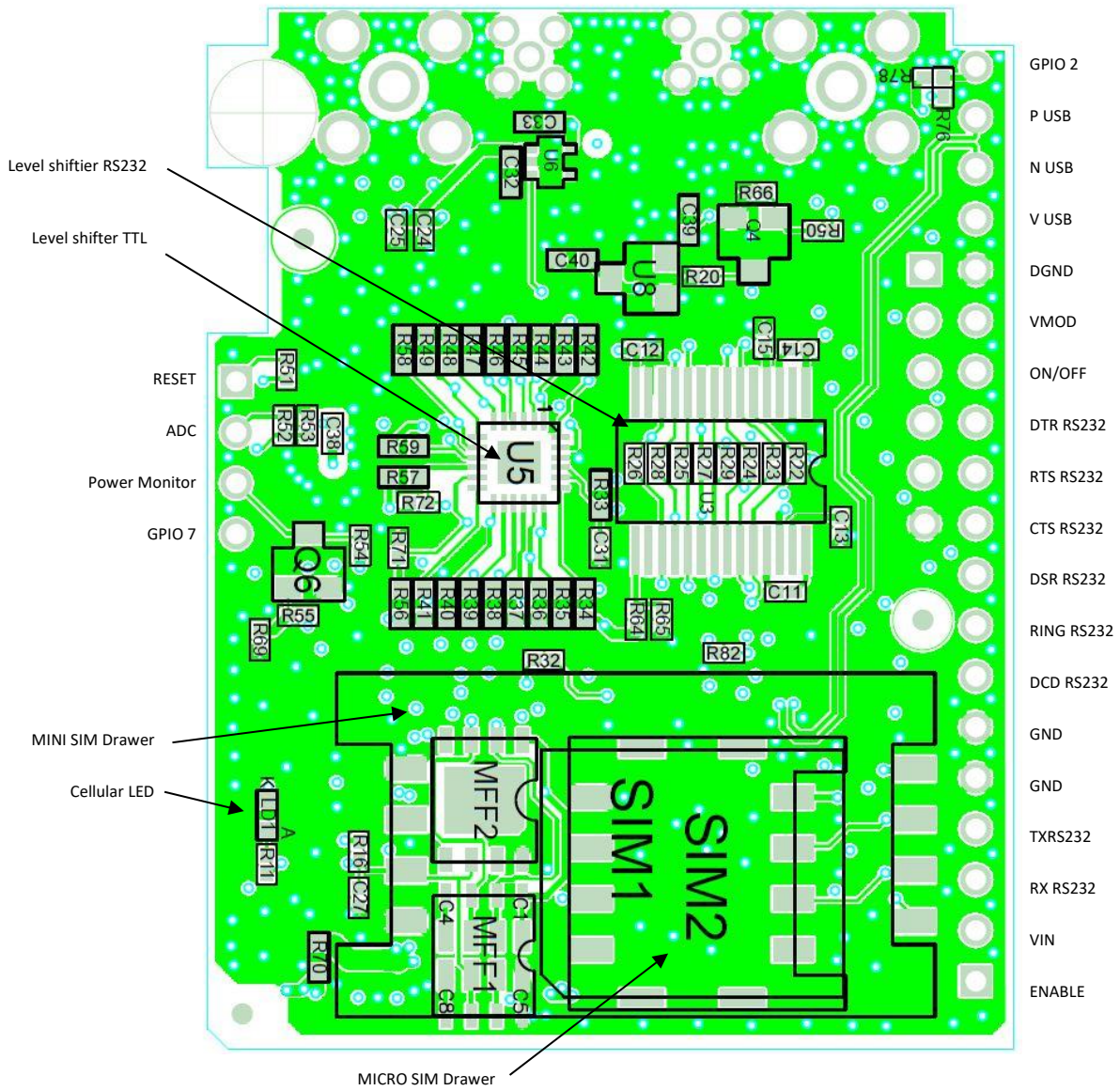
## 2.2 Hardware block diagram



### 2.3 Top View Layout



## 2.4 Bottom View Layout



## 3.1 Power

### 3.1.1 Power Supply

The power supply of the SWH Board requires a single voltage source of 5V-14V capable of providing a peak during an active transmission. There is No internal fuse.

Add an external fuse 1.1A 16V to insure and comply with electrical safety according to EN60950-1.

The power supply recommended is any safety approved power supply, certified IEC 60950-1 or EN 60950-1 or UL 60950-1 with limited output current up to 1A.

Option: Battery operated LiPo 3.7V or Li/SOCI2 battery 3.6V

Pin	Signal name	Use
J3 -- 1	Power Enable	Control pin to turn ON/OFF SWH power. When this pin is HIGH (5V-14V) the unit will be turn ON. When this pin is OPEN or GROUND the unit will be turned OFF.
J3 -- 2	POWER	Input Power supply range 6-14V
J3 -- 5	GND	Ground
J3 -- 6	GND	Ground
J3 -- 14	VMOD	4v output from power supply on board Without Vin applied, the board can operate by connecting this pin to a 3.7v LiPo battery source.
J3 -- 15	GND	Ground

### 3.1.2 Supply voltage requirements

A DC power supply must be connected to the POWER input:

- Input voltage range 6 - 14V DC
- Nominal Voltage 9V DC
- Power Supply current rating: max. 1A @9V
- Power Supply ripple: max. 120mV
- Input current in idle mode: 20mA @ 9V
- Input average current in communication mode: 100mA @ 9V

### 3.2 RF CONNECTOR

The SWH Board uses SMA Connectors, or MMCX Connectors for ANTENNAS

CELLULAR --- use the ANTENNA with 3.5-5dB gain.

GPS/GLONASS --- use the ACTIVE GPS/GLONASS ANTENNA with 25-28dB gain.

### 3.3 RS-232 Interface

The serial interface of the SWH is intended for the communication between the LTE GNSS module and the host application. This RS232 interface is a data and control interface for transmitting data. It accepts, AT commands and provides multiplexed channels. EMC immunity complies with the vehicular environment requirements according to EN 301 489-7. The user interface of the SWH is accessible from a Data Terminal Equipment DTE connected to the RS232 interface and it is managed by AT commands according to the LTE / GNSS specification. The supported commands are listed in the AT Commands Reference Guide.

Connector type on the terminal is:

- RS232 through 2.54mm header
- Baud rate from 300 to 230,400 bit/s
- Short circuit (to Ground) protection on all outputs.
- Input voltage range: -12V to +12V

Pin no.	Signal name	I/O	Function of application
J3 -- 7	DCD	O	Data Carrier Detected
J3 -- 2	RXD	O	Receive Data
J3 -- 3	TXD	I	Transmit Data
J3 -- 12	DTR	I	Data Terminal Ready
J3 – 5,6	GND	-	Ground
J3 -- 9	DSR	O	Data Set Ready
J3 -- 11	RTS	I	Request To Send
J3 -- 10	CTS	O	Clear To Send
J3 -- 8	RING	O	Ring Indication

### 3.4 AUX Interface

The AUX interface provides the following options:

- 1 digital input/output 0-3vdc.
- 1 ADC (10 bit) input 0-5vdc.
- Power monitor pin - this pin when HIGH the modem is ON
- RESET pin - when connected to 'LOW' the modem will restart

Pin no.	Signal name	I/O	Function
J4 -- 1	RESET	I	RESET
J4 -- 2	ADC	ADC	ADC
J4 -- 3	Power Monitor	O	Power Monitor
J4 -- 4	GPIO 7	I/O	GPIO 7

### 3.5 Status LED

#### 3.5.1 Red LED

The Red LED is connected to GPIO1, OFF by default.

Red LED status	Device Status
Permanently ON	A call is active
Fast interrupt sequence (period 0.5s, Ton 1s)	Net search / Not registered
Slow interrupt sequence (period 0.3s, Ton 3s)	Registered full service
Permanently off	Device off

The LED can be used for Network status or controlled by the user.

#### AT Commands:

To activate GSM status Red LED: "AT#GPIO=1,0,2;#SLED=2,1,1"

Turn Red LED ON: "AT#GPIO=1,1,1"

Turn Red LED OFF: "AT#GPIO=1,0,1"



## 4.1 Environmental requirements

Operating temperature range	-40°C to +85°C
Humidity	5% - 90% Non-Condensing

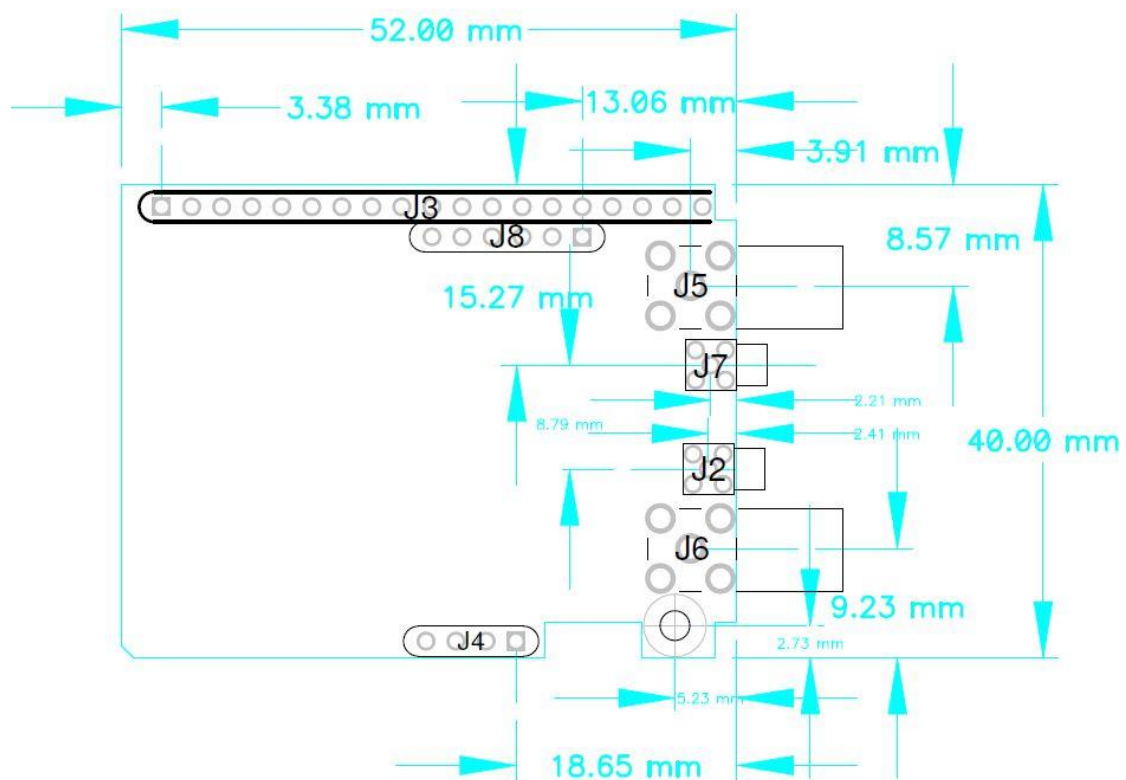
## 4.2 Protection class

IP40 Avoid exposing the board to liquid or moisture.

## 4.3 RoHS compliance

All hardware components are fully compliant with the EU RoHS and WEEE Directive

## 4.4 Board dimension



## 5. SAFETY RECOMMANDATIONS

### READ CAREFULLY

1. The unit does not provide protection from lightning and surge. For outdoor installation use outdoor nonmetallic case safety approved according UL 50. Additionally you should provide protection from lightning and over voltage according National code.

2. Be sure the use of this product is allowed in the country and in the environment required. The use of this product may be dangerous and has to be avoided in the following areas: Where it can interfere with other electronic devices in environments such as hospitals, airports, aircrafts, etc. Where there is risk of explosion such as gasoline stations, oil refineries, etc. It is responsibility of the user to enforce the country regulation and the specific environment regulation. Do not disassemble the product; any mark of tampering will compromise the warranty validity. We recommend following the instructions of the hardware user guides for a correct wiring of the product. The product has to be supplied with a stabilized voltage source and the wiring has to be conforming to the security and fire prevention regulations. The product has to be handled with care, avoiding any contact with the pins because electrostatic discharges may damage the product itself. Same cautions have to be taken for the SIM, checking carefully the instruction for its use. Do not insert or remove the SIM when the product is in power saving mode. The system integrator is responsible of the functioning of the final product; therefore, care has to be given to the external components of the unit, as well as of any project or installation issue, because the risk of disturbing the GSM network or external devices or having impact on the security. Should there be any doubt, please refer to the technical documentation and the regulations in force. Every unit has to be equipped with a proper antenna with specific characteristics. The antenna has to be installed with care in order to avoid any interference with other electronic devices and has to guarantee a minimum distance from the body (20 cm/8"). In case this requirement cannot be satisfied, the system integrator should assess the final product against the SAR regulation. The European Community provides some Directives for the electronic equipment introduced on the market. All the relevant information available on the European Community website:

<http://europa.eu.int/comm/enterprise/rtte/dir99-5.htm> The text of the Directive 99/05 regarding telecommunication equipment is available, while the applicable Directives (Low Voltage and EMC) are available at:

[http://europa.eu.int/comm/enterprise/electr\\_equipment/index\\_en.htm](http://europa.eu.int/comm/enterprise/electr_equipment/index_en.htm)